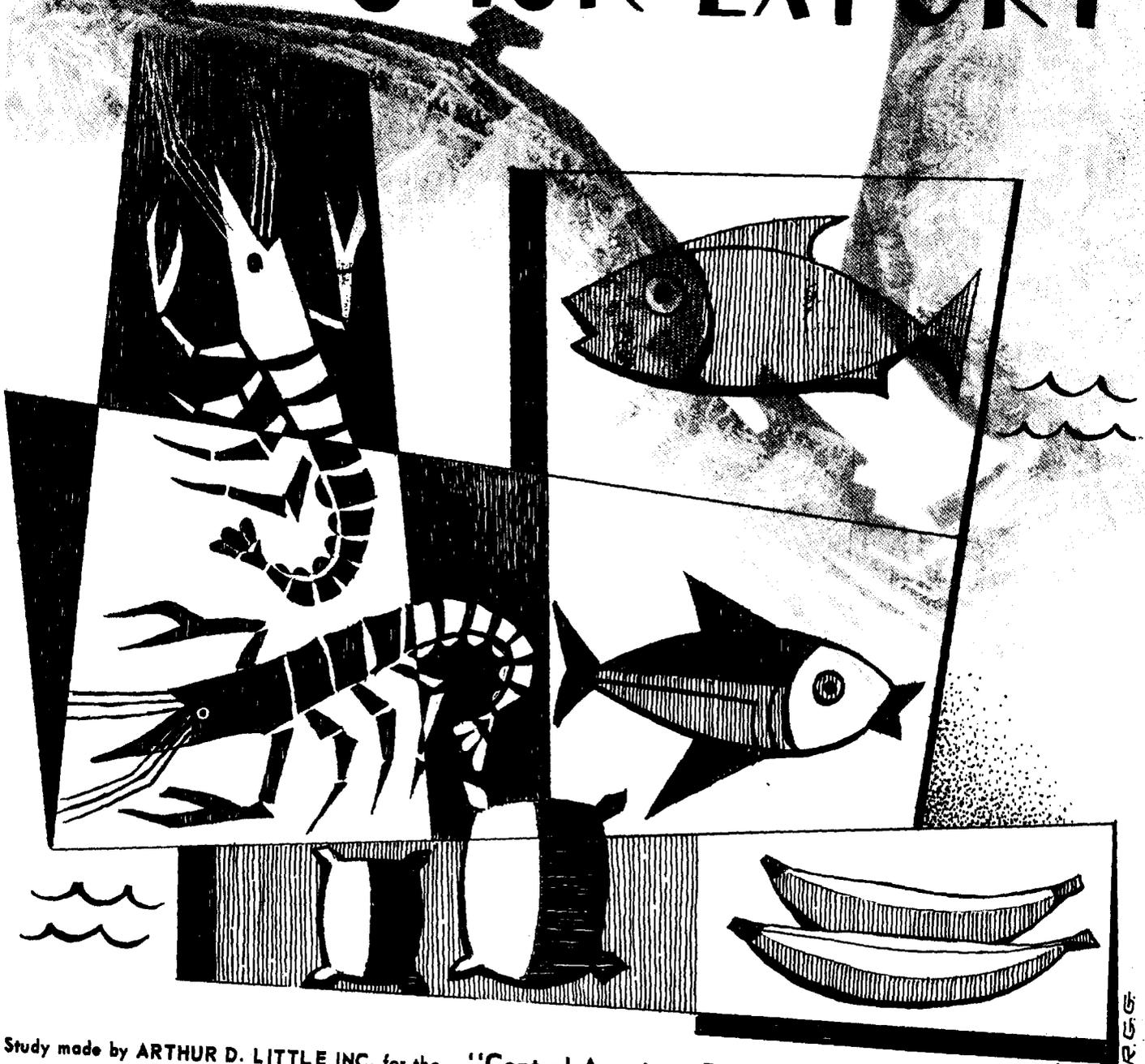


investment opportunities in the  
central american common market

- IN - A - M - E - R - I - C - A -

# FOODS FOR EXPORT



R. G. S.

Study made by ARTHUR D. LITTLE INC. for the "Central American Bank for Economic Integration"

OPPORTUNITIES FOR  
PROCESSED FOOD EXPORTS  
FROM CENTRAL AMERICA

Report to  
Central American Bank for Economic Integration  
Tegucigalpa, Honduras, C. A.

C-65685  
June, 1965



### **ABOUT THE COVER**

The cover design of this publication, as well as for the other three publications in this "opportunity" series, was made by the distinguished Central American artist, Roberto González Goyri, and was commissioned by the Central American Bank for Economic Integration.



# BANCO CENTROAMERICANO

DE INTEGRACION ECONOMICA  
TEGUCIGALPA, D. C., HONDURAS, C. A.

DIRECCION CABLEGRAFICA:  
**BANCADIE**  
TELEFONO 2-2230 AL 39  
APARTADO POSTAL 772

Dear Reader:

The Central American Bank for Economic Integration takes pleasure in presenting to you, as one of a carefully selected group of important potential inventors, the new series of Investment Opportunities in five Industrial fields -- pharmaceutical, chemical, metal products, and processed food exports -- in the Central American Common Market.

The above mentioned investment opportunities were identified by an industrial survey prepared for the Bank by Arthur D. Little, Inc., under the auspices of the Regional Office for Central America and Panama of the Agency for International Development of the United States of America (ROCAP).

In this occasion we would like to encourage your interest in these specific industrial opportunities, and to extend you a most cordial invitation to visit one of our offices to have the pleasure of assisting you personally.

In addition to our main office in Tegucigalpa you may contact our field offices in Guatemala and New York City at the following addresses:

Investment Development Department  
Guatemala Office  
7a. Avenida "A" 9-30, zona 9  
Guatemala City, Guatemala  
C. A.

Mr. Jesús Díaz Hernández  
New York Office Consultant  
200 Park Avenue  
Pan American Building Room 1403  
New York, New York

If you require additional information, please do not hesitate to write us at your earliest convenience.

Sincerely,

CARLOS H. MATUTE  
CHIEF INVESTMENT DEVELOPMENT DEPARTMENT

U

## INDEX

	<u>Page</u>
I. INTRODUCTION	1
II. SUMMARY	2
III. OPPORTUNITIES	5
A. IMPROVEMENT TO THE SHRIMP-FISHING AND SHRIMP-PROCESSING INDUSTRIES	6
B. PROCESSING OF FRESH OR FROZEN SCALE FISH	14
C. FACILITIES FOR PROCESSING TUNA FISH	19
D. PINEAPPLE	25
E. CANDY MANUFACTURE	28
F. BANANA UTILIZATION	35

*t*

. 1

## I. INTRODUCTION

The Central American Bank for Economic Integration in keeping with its commitment to accelerate the development of regional industries to supply the Central American Common Market as well as to increase exports from the area, engaged Arthur D. Little, Inc. to review the areas of metal fabrication, chemicals, pharmaceuticals and food processing for export. The purpose of our work was to screen these industrial areas for specific regional possibilities which in our opinion merit detailed feasibility studies.

THE PROJECTS REPORTED HEREIN ARE NOT FEASIBILITY STUDIES; rather they represent a compilation of certain key information gathered in the field and supplemented by the professional assessment of Arthur D. Little staff members; we believe that these projects present good opportunities which warrant more detailed investigation. Therefore, we recommend in all cases that interested potential investors spend the necessary funds to evaluate each of the projects in depth.

Some of the opportunities discussed in this report are new and, as far as we know, are not the subject of an investment project by any group in Central America. Others are in various stages of planning by one or more groups; it is hoped that this report will help to accelerate and crystallize projects already under study through the encouragement that our preliminary favorable conclusions afford. It is in the interest of the Central American Common Market that these projects be acted upon as soon as possible. Publication of data we have accumulated and the promotional efforts of the Investment Development Department of the Bank should spur competing investor groups to action.

Throughout the report we have generally omitted names of individual companies in order to protect their interests; we understand the Investment Development Department of the Central American Bank for Economic Integration will supply further information where necessary and will assist potential investors through all means at their disposal.'

We gratefully acknowledge the assistance and collaboration of the Instituto Centroamericano de Investigaciones y Tecnología Industrial in Guatemala City in providing counterpart staff and valuable guidance throughout the course of our study. We further acknowledge the considerable help of all departments of the Banco Centroamericano de Integración Económica and of the Regional Office, Central America and Panama Affairs of the U. S. Agency for International Development.

II. SUMMARY

Processed foods accounted for about \$50 million of Central America's \$350 million of food exports in 1962\*.

	<u>\$ Million</u>	
<u>Unprocessed</u>		303
coffee	216	
bananas	64	
cocoa	5	
cattle	5	
corn	3	
cottonseed meal byproducts	3	
hogs	2	
beans	2	
honey	1	
other	2	
 <u>Processed</u>		 50
meat	16	
sugar	11	
shrimp and lobster	9	
soluble coffee	5	
vegetable shortening	2	
other	7	
T o t a l		353

\* Source: Tercer Compendio Estadístico Centroamericano

The incentive to increase processed food exports is great because of the resulting foreign exchange earnings and the improvement and diversification of the agricultural-industrial base of the Central American economy.

Part of the growth expected in processed food exports will come from increased export activity by food processors whose primary business now is to supply Central American markets. Thus, for example, a tomato paste producer may find it expedient to expand production to serve markets outside Central America once local demand is satisfied. On the other hand, major expansion of processed food exports will come about only if considerable attention is given to those industries whose primary function is export, and who only incidentally fill Central American market needs. It is this latter group which has commanded our attention.

The six projects we recommend for serious investor attention are shown in the Processed Food Export Project Summary Table. They involve a total investment of about \$18 million and would employ 900 to 1,600 persons. Establishment of all six projects would result in additional export sales by 1970 of some \$21 million. Annual earnings of foreign exchange would be about \$17 million and value added in the region would be about \$18 million.

Estimated 1970 exports from the six projects alone would represent a 40% increase in processed food exports above the 1962 level.

PROCESSED FOOD EXPORT PROJECT SUMMARY TABLE

<u>Project</u>	<u>Capacity Tons/year</u>	<u>Employees (Total)</u>	<u>Capital (\$ Million)</u>			<u>1970 Estimates (\$ Million)</u>		
			<u>Fixed</u>	<u>Working</u>	<u>Total</u>	<u>Sales</u>	<u>Value Added in Region</u>	<u>Annual Earned Foreign Exchange</u>
Shrimp	5,000	250 - 500	7	3	10	10	10	9
Scale Fish	2,500	100 - 200	0.5	0.5	1	1	1	1
Tuna Fish	12,500	200	1.3	1.3	2.6	4.3	2	1.8
Pineapple	180	20	0.1	0.1	0.2	0.1	0.1	0.1
Candy	5,000	100 - 200	0.5	0.6	1.1	1.6	1.6	1.5
Banana Products	15,000	<u>200 - 500</u>	<u>2.2</u>	<u>0.7</u>	<u>2.9</u>	<u>3.6</u>	<u>3.6</u>	<u>3.4</u>
T o t a l		870 -1620	11.6	6.2	17.8	20.6	18.3	16.8

5-

**III. OPPORTUNITIES**

## A. IMPROVEMENT TO THE SHRIMP-FISHING AND SHRIMP-PROCESSING INDUSTRIES

We recommend that a detailed feasibility evaluation be made of one or more well financed and managed operations for shrimp fishing and processing. Since a number of marginal operations now exist, it may be prudent to acquire or invest in one or more of these enterprises.

### 1. DESCRIPTION

The Central American shrimp-fishing industry, comprised as it is of many small-volume operators, has fallen into technological and economical stagnation. The talents and resources of an adequately capitalized company should be capable of bringing about certain procedure and equipment changes which should improve the economics of producing shrimp. Improved boat design, the use of fish-finding equipment, and the regular maintenance of vessels are apparent means of offering significant improvement in the yield of shrimp per unit of investment. Preliminary studies indicate that at present shrimp boats average only 16 days of fishing per month. Because of inadequate equipment maintenance, the vessels have excessive "down time" for repairs.

The fishing industry generally consists of operators who control from 8 to 40 or more fishing boats. Although a vessel may be operator-owned, control of the fishing operation may reside with the processor through a mortgage or other financial obligation. The operators may control a shrimp-freezing and packing plant which may be very rudimentary or reasonably highly developed, but which in most instances is heavily mortgaged. The operators, because of lack of capital and lack of management acumen, almost invariably use less than 50% of the boat-days available to them. When an operator owns or controls 20 boats, he will be operating less than 10 on an average because the others will be down for repairs to either fishing gear or the hull and because the operator cannot afford to maintain an inventory of spare parts. When repairs are needed, the operator must send for parts to the United States, Europe, or even to Japan. Operation in this way requires that the parts must be flown in at an excessive cost and results in the waste of considerable time. Sometimes boats will be sent out to fish with only one set of nets. Since shrimp fishing as it is now conducted is a bottom-fishing operation, the nets are frequently torn. If a boat tears its only set of nets it must stop fishing and come in for repair or replacement of the fishing gear.

It appears that at least an increase of five days per boat per month could be achieved through proper preventive maintenance. The cost of such a program would return at least three or four times the investment through the increased production per vessel. Under this proposed project some method would be established to finance the necessary maintenance and the inventory of spare parts that would be required to increase the fishing time per boat by at least one-third, and consequently to increase volume of production by one-third.

Traditional operation of shrimp nets has been confined to a procedure of "scraping" the ocean floor. Marine biologists as well as boat operators have reported that large quantities of shrimp may be found at intermediate depths. It is reported that equipment available for locating and tracking shrimp at all depths is being used successfully by the Japanese and could be used in Central American vessels with dramatic results. It is estimated that if this equipment would increase the rate of production of shrimp by 25%, then the cost of producing shrimp in Central America would be reduced by 20¢ per pound.

Essentially all of the annual production of shrimp from Central America comes from close to shore within the 20-fathom line. There are indications of large masses of species of red shrimp outside the 20-fathom line. There is much shrimp caught in the Gulf of Mexico, for example, beyond this depth, and deeper fishing also is being conducted in Panama with successful results.

Of course, it will be necessary definitively to establish that there is a residue of shrimp yet to be exploited. It is very likely that this is the case. Shrimp is an annual crop which usually develops year after year, unless, as occasionally happens, there is some major biological catastrophe in the area. This is a risk of the shrimp business which must be recognized. Unless those shrimp which do mature every year are caught, however, they die, and that part of the crop is lost. The conservation methods generally being practiced in Central America seem to be adequate. Fishing is prohibited in the coasts of bays and mouths of rivers which are the spawning grounds for the shrimp. Since climate, including rainfall, of this area follows a regular cycle year after year, it can be expected that the shrimp crop generally is consistent.

A study of the two-year catches of at least 12 trawlers operating on the West Coast of Central America showed that the catches of these trawlers vary from 65,000 lbs. of shrimp per boat to 175,000 lbs. of shrimp per boat per year. It is also noted that the boats with high catches consistently catch more shrimp per year every year. Also, the pounds of shrimp caught can be equated to the number of days that each trawler is out fishing. The boats with the highest yields are operated by capable, conscientious captains who happen to have enough mechanical ability to keep their vessels at sea. There is no reason to expect that those vessels that caught less than 100,000 lbs. of shrimp could not approach 175,000 lbs., providing that they were at sea more than 16 days per month.

AVERAGE ANNUAL CATCH 1962-1963  
FOR SPECIFIC CENTRAL AMERICAN SHRIMP TRAWLERS

<u>Boat</u>	<u>Lbs. of Shrimp per Year</u>	<u>Average No. Days Fished per Year</u>
Lempa	150,000	241
Irazú	138,000	239
Salvador	129,000	236
Comanche	105,000	199
Isabel	175,000	261
Del Norte	65,000	150
Usulután	142,000	235
San Miguel	140,000	230
Rio Grande	155,000	250
Lempa II	149,000	228
Jiboa	140,000	206
Norte 8	28,000	60
Norte 9	52,000	80
Norte 11	110,000	180

SHRIMP EXPORTS

Thousands of \$

	<u>Guatemala</u>	<u>Salvador</u>	<u>Honduras</u>	<u>Nicaragua</u>	<u>Costa Rica</u>	<u>Total</u>
1962	944	5,633	183	1,562	903	9,225
1963	1,944	6,668	835	1,610	1,508	12,565
1964	2,207	6,296	698	2,521	1,977	13,699

Note: Salvador with only a short Pacific coast line has an overwhelming amount of the shrimp catch.

Honduras has no West coast line that can be fished for shrimp.  
The Golfo Fonseca is not fished as a conservation procedure.

It can be expected that if the entire West Coast of Central America were fished to the extent that Salvador was, then the entire Central American catch would be related to the Salvadorian catch as is the relative coast line. Salvador has about one-tenth of the Central American coast line. In 1963 9 million lbs. of shrimp were caught in Salvador; therefore, the entire West Coast of Central America may have had the capacity to produce 90 million lbs. Even if this rough estimate is off by 50% (and it probably isn't), the total available of 45 million is almost three times that actually produced.

In addition to the improvements in fishing methods there is considerable room for the increased processing of shrimp. Historically, shrimp have been processed only to the extent of grading according to size, packaging, and freezing. Until recently, the commercial item was exclusively the 5-lbs. box of frozen, green, headless shrimp assembled in a 50-lb. carton.

Within the last three or four years there has been a demand for more-completely processed shrimp -that is, shrimp that has been cleaned, deveined, and individually frozen, or cleaned, deveined, cooked, and individually frozen. Some of this work is now being carried out in Central America. There are areas where small shrimp are being discarded because their value is not adequate to justify the necessary conventional processing. In these instances, with the low local labor cost, the small shrimp could be peeled, deveined, and individually frozen and upgraded in value for the market at a potential profit. This project would supply the necessary money and management to establish a sound fishing and processing industry.

## 2. MARKET AND DISTRIBUTION

The market for shrimp is world-wide. The largest market is the United States which consumes in excess of \$300 million of shrimp per year. The Japanese market is rapidly growing and now requires about \$80 million of frozen shrimp per year. The European market is rapidly changing from the small North Atlantic shrimp to the large tropical shrimp. While the European market is now less than \$10 million per year, it is rapidly growing. The amount of shrimp being consumed in the United States has been increasing every year by more than 10%, with the limiting factor only the amount of shrimp available. The U.S. price of shrimp is increasing each year.

Shrimp is probably the most highly accepted marine protein food in the world and there is every indication that it will continue to be so. While shrimp consumption throughout the world has increased at the rate of about 10% per year during the past five or six years, it can be expected that this rate will increase and be dependent only upon the amount of the shrimp catch. Therefore, it can be anticipated that the potential market for shrimp exported from Latin America can increase as much as 10 million lbs. each year for many years.

Shrimp is or can be produced in every tropical or subtropical marine area of the world. Presently, large producers of shrimp are Mexico, Central America, South America, southern United States, India and other Asiatic tropical and semitropical waters. It can be expected that each of these areas will continue to increase their production in this particularly lucrative market. There are few countries or regions that have organized methods of distributing their catches. Shrimp is now normally distributed in the United States through brokers that represent many and frequently all of the producing areas. It may be of importance to establish a Central American shrimp-distributing agency.

ESTIMATED ANNUAL EXPORT MARKET POTENTIAL  
FOR CENTRAL AMERICAN SHRIMP

(For each year until 1970. Add 10%/yr for each yr in 1970's in \$U.S. CIF)

<u>Country</u>	
United States and Canada	\$20,000,000
Europe	1,000,000
United Kingdom	500,000
Japan	<u>10,000,000</u>
T o t a l	\$31,500,000

Availability of raw materials has been generally discussed previously. There is one area of raw material availability that has not been discussed, and that is availability of shrimp on the East Coast of Central America. There has been little activity in this area because of the difficult sea bottoms encountered and because of the variable weather conditions. The fishing enterprise at Bluefields in Nicaragua, however, has recently been acquired by Booth, a major fish producer and a subsidiary of Consolidated Foods, and there are indications that proper fishing techniques can greatly increase the shrimp that are available from this area. It can be conservatively estimated that the shrimp catch of Central America can be increased at least 25% over the last five years' average, and possibly as much as 50%. This means that 10-20 million lbs. of shrimp can be added to the annual export potential of the Central American industry.

### 3. COSTS

Preliminary investigations indicate that shrimp is being produced in Central America for about \$1000 per ton. Costs, of course, vary considerably and probably range from \$800 per ton to more than \$1600 per ton. In addition to production costs, there are such expenses as transportation, selling costs, and taxes. The over-all cost of Central American shrimp placed in a U.S. port has averaged an estimated \$1250 per ton during the past two years. Average sales prices for the same shrimp are estimated at \$2000 per ton. Special lots of shrimp bring more or less in the market place, depending upon the size and variety (color). Small shrimp bring lower prices.

It is important to note that a peculiarity exists in costing and pricing of shrimp. It is obvious that the cost of operating a vessel to catch shrimp is independent of the size and color of shrimp that are caught. The sales prices, however, do not reflect the actual cost. During certain seasons of the year and on certain areas along the coast large white shrimp are caught in abundance. These shrimp demand a premium in the market place, although the cost of producing them may be less than that of producing the small brown shrimp caught at another season of the year. The selling price of shrimp is established by quality.

a. Labor

The usual shrimp trawler of 50 to 60 ft. employs a crew of from three to six men. The captain of this crew must be a highly trained individual in navigational skills as well as fishing skills. Generally speaking, the qualifications of the captains of the shrimp trawlers in Central America are poor. In Guatemala, for example, a fishing company has found it desirable to import Japanese captains, and in San Salvador, one of the fishing companies has found it desirable to employ Portuguese captains. In each instance, of course, Central American nationals are being trained to carry out these duties. There is no reason to expect why this training should not yield competent Central American captains. The balance of the crew is generally semiskilled labor which requires a minimum of training in the skills of fishing. There is, of course, an abundance of this type of labor in most Central American coastal areas. Cost of this labor is low when compared to costs of comparable labor in the Mexican ports or the southern U. S. ports.

In addition to the shrimp-catching labor, it is necessary to use a considerable amount of unskilled labor in the cleaning, sizing, packing and freezing operations in the shore-based plants. This help is almost 100% female and there has been an abundance of this help in those areas where shrimp is now being processed.

b. Shipping Costs

Frozen shrimp can be shipped from Central American areas to the world markets by ocean. There are two general methods of transporting the frozen commodity. One is the direct loading into frozen compartments of the ocean vessels at the ports since the fishing and packing operations frequently take place close to these ports. In many instances, however, it is more economical to ship the frozen product by highway trailer from the processing plants to such a port as Matías de Galvez and then by trailership to the United States. Costs vary from \$60 to \$100 per ton from the point of shipment to the port of entry. One-hundred dollars per ton is adequate for shipping of shrimp from West Coast Central America to Japanese ports. Sixty dollars per ton is adequate for shipment of shrimp through Matías de Galvez to New York. Similar costs can be experienced for shipping along the West Coast from Central America to San Diego, Los Angeles, or San Francisco.

Transportation costs from Central America to the United States can be expected to be greater than similar costs from Mexico to the United States but certainly are less than costs from Asiatic shrimp-producing countries to the United States.

#### 4. INVESTMENT

It is extremely difficult to estimate with any precision the fixed capital investment required without performing an extensive feasibility study to determine the optimum economic extent of the project. There are two major types of capital investment that will be required. In one instance it will be necessary to establish rather comprehensive warehouses of repair materials and fishing supplies so that fishing vessels can operate continually. (Depending upon accounting procedures this may be operating capital). It will also be necessary to establish repair facilities such as dry docks, machine shops, etc. The investment for this kind of repair, maintenance and supply effort will be in excess of \$1 million but less than \$3 million.

Another area of capital investment will be that of modernizing the fishing vessels to use improved fishing techniques. It is certain that many vessels will have to be replaced as they become obsolete. A fishing vessel may cost as much as \$75,000 fully equipped, and the rehabilitation of an existing vessel may be as high as \$30,000. It is likely that the investment in modernization or replacement of fishing vessels will be in excess of \$3 million. It is difficult to estimate the top level in this area. To summarize, fixed capital investment required for this project is estimated to be in excess of \$4 million.

#### 5. ELEMENTS FOR FUTURE CONSIDERATION

An interesting additional fishing and processing industry that may be appended to a shrimp industry is that concerning lobster tails. Lobster tails demand a high price in the United States, approximately \$1.50 per lb. They are now imported from Australia and Africa. The type of lobster from which the tail is secured occurs in abundance in the same areas that shrimp are caught. Frequently, almost in every shrimp-net haul, there are a very few lobsters caught. These lobsters are now butchered and frozen by the shrimp-processing plants and held until small but sufficient quantities are available to ship to the United States. The market for these lobster tails is large. Not only do the tails find a very large acceptance in the retail trade, but they are in great demand, too, for use as components in the Epicurian type of precooked frozen meals.

The capture of these lobsters has not been easy, and hence there has been little incentive for the small local fishermen to exploit the resources. These lobsters cannot be caught in any number by the conventional

shrimp trawls. These lobsters also avoid traps that are so successfully used for North Atlantic lobster. The future of this commodity lies in the results of research work yet to be done by the marine biologists and fishery technologists on ways and means of catching the lobster.

This product is being exploited to a considerable degree in British Honduras. The methods of capture there can be studied, expanded, and modified to be applied to the rest of Central America.

## B. PROCESSING OF FRESH OR FROZEN SCALE FISH

We recommend that a definitive and comprehensive study be undertaken to determine the economic and technical feasibility of the establishment of a facility to process scale fish. The facility we envision would produce frozen fish items in several categories. It would be oriented toward the export market for shipment to the United States.

### 1. DESCRIPTION

The harvest of the open sea should be aggressively pursued by all the world's nations with seacoasts. Some nations, notably the Soviet Union and Japan, are making gigantic fishing efforts, having more than doubled their catches in the last 15 years. Judging from the standpoint of size, number of people employed, and value of the food produced, the fishing industry is a huge and important one.

The annual sale of fishery products in the United States approaches \$2 billion at the retail level. The 1963 catch was 4.6 billion pounds at a producer's value of \$388 million. The yield of foreign fishermen producing fish for the U. S. market alone is estimated to exceed \$250 million.

The future for the world fishing industry should be bright. It has been predicted that by 1975 fish consumption will have increased by a factor of three over current rates. This estimate was based upon the following factors:

Increased population.

Young families will be more conscious of nutritional requirements.

Family incomes will be greater.

Fish offer dietary variety.

Fish is believed to offer special dietary advantages in that fish oils have a high level of unsaturation. The calorie-conscious individual will also find advantages in fish.

Fish is becoming more important in the diets of the very young and of the elderly.

Governments of the major consuming countries are promoting fish consumption.

The Central American countries are not now participating in the increased exploitation of the seas. The following tables indicate that very small amounts of fish are caught in Central America.

WORLD CATCH MARINE FISH

<u>Year</u>	<u>Millions of Metric Tons - Live Wt.</u>
1958	2.4
1959	2.7
1960	2.9
1961	3.2
1962	3.5
1963	3.6

TOTAL MARINE FISH CATCH BY CONTINENT  
(Millions of Metric Tons)

<u>Year</u>	<u>Asia</u>	<u>Europe</u>	<u>South America</u>	<u>North America</u>	<u>Africa</u>	<u>USSR</u>
1958	14.5	7.7	1.6	4.0	2.1	2.6
1959	14.7	8.2	2.9	4.3	2.2	2.8
1960	16.4	8.1	4.4	4.2	2.3	3.1
1961	17.2	8.3	6.3	4.3	2.5	3.3
1962	17.6	8.5	8.3	4.5	2.6	3.6
1963	17.8	8.8	8.5	4.3	2.8	4.0

WESTERN HEMISPHERE FISH CATCH  
(Thousands of Metric Tons)

<u>Country</u>	<u>1959</u>	<u>1961</u>	<u>1963</u>
Canada	1054	1020	1191
Cuba	29	31	36
Dominican Republic	1.6	1.6	-
El Salvador	5.8	12.5	13.6
Guatemala	-	0.7	-
Honduras	-	-	-
Mexico	192	225	244
Nicaragua	-	-	-
Panama	14.8	11.4	-
Puerto Rico	2.9	3.3	4.2
United States	2890	2931	2712
Argentina	89	94	124
Brazil	239	275	-
Chile	273	430	763
Colombia	21	48	47
Ecuador	36	40	52
Peru	2152	5293	6901
Venezuela	83	85	97

<u>MID AMERICA FISH CATCH</u>				
<u>(Thousands of Metric Tons )</u>				
<u>Country</u>	<u>1959</u>	<u>1961</u>	<u>1963</u>	
El Salvador	5.8	12.5	13.6	
Guatemala	-	0.7	-	
Honduras	-	-	-	
Nicaragua	-	-	-	
	<hr/>	<hr/>	<hr/>	
T o t a l	5.8	13.2	13.6	
Mexico	192.0	225.0	244.0	
Panama	14.8	11.4	-	
	<hr/>	<hr/>	<hr/>	
T o t a l	206.8	236.4	244.0	

## 2. MARKET AND DISTRIBUTION

Seafood is sold and used throughout the world in fresh, frozen, canned and other processed forms. The consumption of fresh and frozen fish is increasing annually, while consumption of processed forms (canned and cured) of fish is increasing at a lesser rate.

### DISPOSITION OF WORLD FISH CATCH (Millions Metric Tons)

	<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>
Fresh and frozen	16.0	18.2	18.9	19.7	20.2
Cured	7.3	7.2	7.3	7.5	7.6
Canned	3.0	3.3	3.5	3.9	4.0
Nonfood purposes	5.3	7.2	8.5	10.7	12.9

Fresh and frozen fish, cut or dressed, is a familiar form in the market place. These cuts of fish are generally described as:

- a. Whole or round fish
- b. Drawn fish
- c. Dressed fish
- d. Steaks
- e. Fillets
- f. Sticks
- g. Portions

Those cuts that have received considerable preparation are frequently breaded or coated with batter to increase their convenience to consumers. As a result there have developed in the United States large markets for frozen, breaded fish sticks.

U. S. PRODUCTION OF FISH STICKS AND PORTIONS  
(1000 lbs.)

	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>
January	9,143	10,394	11,159	15,727
February	10,044	11,999	13,246	15,602
March	12,550	13,064	14,694	16,888
April	8,363	10,083	12,127	14,465
May	6,960	9,008	11,461	13,043
June	8,364	8,967	11,254	14,899
July	7,779	7,537	8,419	9,394
August	8,571	11,890	12,447	12,380
September	10,055	10,951	13,762	15,486
October	11,835	12,892	16,569	18,005
November	11,071	12,077	13,711	14,607
December	9,788	10,809	12,046	13,446
T o t a l	<u>114,523</u>	<u>129,671</u>	<u>150,895</u>	<u>173,942</u>

United States production and consumption of fish sticks is improving at a rate greater than 10% per year. Fish stocks and fish portions are symmetrical cuts of fish fillets. The difference between sticks and portions is strictly a geometric one, the stick usually being a long, rectangular bar, while the fish portion is frequently flat. Fish sticks and fish portions are produced and sold in the four variations: raw breaded, cooked breaded, raw plain and cooked plain.

The fish that go into the manufacture of fish sticks represent a variety of species. Cod, haddock, and withing are popular components. In recent years, Mexican fisheries have begun marketing fish sticks produced from a large, bottom fish known by the common name of grouper. Preliminary surveys in Northern Central America indicate that this fish exists in substantial numbers along the Pacific Coast of Central America.

Since the grouper is extremely large, frequently weighing 400 to 500 pounds, the dressing and processing of its meat into fish portions or sticks is simplified and high yields can be expected.

Projected growth of the market for fish sticks and portions in the United States can be expected to be at a rate of about 10% per year. The Central American producer can be expected to share not only in the existing market, but in the increased market as well, provided he has the ability to compete on an economic basis.

Competition for the market for fish sticks and portions in the United States can be expected from both U.S. and Mexican sources. In the United States the major producers are Gorton's of Gloucester through its many subsidiaries, and Booth Fisheries, a subsidiary of Consolidated Foods. There are numerous small processors in the United States and Mexico who distribute their product through brokers.

The major market for Central American fishery products will be, we believe, the United States, although European markets will contribute. The major outlets for these products will be supermarket chains such as A&P, Kroger, Safeway, Jewel Tea, and others. In addition, the institutional market is equally as large and is supplied by major fisheries distributors.

### 3. COST AND AVAILABILITY

Manufacturing fish sticks involves a high proportion of hand labor in which Central America can gain a competitive advantage.

It must be confirmed that adequate amounts of fish, primarily the grouper, exist along the West Coast of Central America to make an enterprise worthwhile. Sources of this information are the several fishery research groups operating under the auspices of the Food and Agriculture Organization (FAO) of the United Nations. In addition to the grouper, a very high-quality fish known locally as corvina may also exist in sufficient quantities to exploit. The flavor and texture characteristics of both of these fish are very high and should offer some advantage in obtaining a portion of the market.

#### POSSIBLE FROZEN FISH PRODUCTS OF CENTRAL AMERICAN PROCESSORS

<u>Species</u>	<u>Cut</u>	<u>Preparation</u>
Grouper	Sticks	Raw
Grouper	Portions	Breaded, Raw
Grouper	Sticks	Breaded, Deep Fat Fried
Corvina	Fillets	Raw
Corvina	Fillets	Breaded, Deep Fat Fried
Corvina	Steaks	Raw
Grouper and Corvina	Fish Cakes	Cut, Mixed, Deep Fat Fried

### 4. INVESTMENT

We envision several installations located along the West Coast of Central America, each convenient to a fishing port. We estimate that each installation will require a fixed capital investment of \$50,000 and will have an approximate capacity of 1,000,000 lbs. of frozen fish per year. In addition, of course, the investment necessary for the fishing vessels will be required. A detailed feasibility study may indicate the desirability of combining this operation with the tuna or shrimping operations. The amount of working capital will vary with the fishing seasons but we estimate that it will be necessary to supply \$50,000 of capital to support the operation at full capacity for 90 days.

### C. FACILITIES FOR PROCESSING TUNA FISH

We propose a detailed feasibility evaluation for the establishment of a manufacturing facility to produce canned and frozen tuna in several grades and to produce as by-products fish meal and fish oil.

#### 1. DESCRIPTION

The plant proposed above should be designed to process 50 tons of whole, raw tuna per day, or 12,000 tons annually, operating 8 hours per day, 240 days per year.

This plant will yield annually:

468,000 cases of 48, ½-lb. cans of tuna  
1,320 tons dried fish meal  
435 tons fish oil

Such a facility will:

- a. Utilize an available special natural resource endowment in raw material and abundant manpower which provide production cost advantages and competitive strength in the export market.
- b. Permit for Central American use the production and expanding distribution at lower prices of goods which would otherwise be imported at prices above the average local consumer's ability to buy.
- c. Provide means of earning foreign exchange through the exportation of the products, and yield foreign exchange savings benefits by reducing or eliminating the need for importing similar commodities.
- d. Employ at least 200 persons.
- e. Improve the protein, fat, and vitamin content of the Central American diet for a mass segment of the local population.
- f. Provide a local source of supply of high protein animal feed, at reasonable prices, for livestock production.
- g. Provide a Central American source of vitamins A and D for pharmaceuticals and food fortification, and oil for industrial purposes.
- h. Yield a satisfactory commercial profit on the investment.
- i. Create additional wealth, contribute to economic stability, and increase area income.

## 2. MARKET AND DISTRIBUTION

A potential market exists in the United States for sales of high-quality, fancy, solid pack and standard chunk pack white and light meat tuna at competitive prices to buyers of advertised and private brands.

The outlook for supplies of edible fishery products in the United States in the coming years is not expected to change from previous years. The total United States domestic catch will probably decline, but more fishery products are expected to be imported. Increase of United States imports are expected to offset the small decline in the total domestic fishery landings anticipated in coming years. Retail prices of canned tuna are expected to firm up. Little change is expected in the United States per capita consumption in the coming years. During the 10-month period of January through October, 1963, the United States took 58% of the Japanese canned tuna exports, mostly packed in brine, at a value of about \$18 million. Substantial marketing potential also exists in West Germany, United Kingdom, Canada and Switzerland for canned blue fin, yellow fin, and skipjack tuna. The following imports from Japan, the principal source of supply, have been reported for the period April to December.

<u>COUNTRY</u>	<u>CASES, 1963</u>	<u>CASES, 1962</u>
WEST GERMANY	531,000	385,000
CANADA	176,000	161,000
UNITED KINGDOM	145,000	62,000
SWITZERLAND	102,000	89,000

The consumption of tuna is also increasing in Italy. In 1961 Italy imported approximately 31,000 metric tons of frozen tuna, and in 1962 about 35,000 metric tons. In 1964 it is estimated that 48,000 tons were imported. In addition, it can be anticipated that substantial quantities of fine-quality, high-protein canned tuna will be consumed in the Central and South American market.

CALIFORNIA TUNA PACK

	<u>Per Cent</u>	<u>1961 - 1963 Cases - Annual Average</u>
Albacore - White Meat		
Solid Pack	10.88	3,273,959
Chunks - Standard	4.58	1,377,834
Flakes and Grated	<u>2.30</u>	<u>693,769</u>
Total White Meat	17.76	5,345,562
Light Meat		
Blue and Yellow Fin, Skipjack		
Solid Pack	6.44	1,938,340
Chunks - Standard	68.15	20,524,949
Flakes and Grated	<u>7.65</u>	<u>2,306,649</u>
Total Light Meat	82.24	24,769,938
Total White and Light Meat	100.00	30,115,500

AVERAGE TUNA PRICES 1962 - 1963

\$U.S. Per Case

	At U.S. Port	<u>Net Producer Yield Per Case</u>	
		<u>In Brine Duty 12.5%</u>	<u>In Oil Duty 35%</u>
<u>Advertised Brands</u>			
White Meat Fancy	15.67	13.58	11.32
White Meat Chunks	13.50	11.65	9.71
Light Meat Fancy	14.92	12.92	10.76
Light Meat Chunks	13.17	11.36	9.47
Grated or Flakes	8.13	6.88	5.73
<u>Private Labels</u>			
White Meat Fancy	12.88	11.00	9.25
White Meat Chunks	11.31	9.71	8.60
Light Meat Fancy	11.56	9.93	8.97
Light Meat Chunks	10.00	8.54	7.86
Grated or Flakes	8.00	6.76	5.64

The large-scale, well-organized, and aggressive fishing activity of the Japanese is expected to continue to exert an influence on the export market trends of the tuna industry. During 1963 Japan exported 137,000 metric tons of frozen tuna at an estimated value of \$50 million, and 4,000,000 cases of canned tuna at an estimated value of \$34.5 million. The export targets for 1964, which were probably met, were projected to 178,000 metric tons of frozen tuna at an estimated value of \$61.6 million, and 4,450,000 cases of canned tuna at an estimated value of \$34.5 million.

Increased tuna fishing, processing and canning activities are indicated in Perú and Ecuador, but any significant effect on the tuna export market has not yet been demonstrated. Latest available published statistics reveal the following tuna export data:

FRESH AND FROZEN

<u>COUNTRY</u>	<u>METRIC TONS</u>		
	<u>1960</u>	<u>1961</u>	<u>1962</u>
PERU	18,300	4,700	14,400
ECUADOR	4,300	3,100	5,200

CANNED PRODUCTS

PERU	5,000	5,000	4,000
ECUADOR	1,000	1,400	1,500

3. COSTS AND AVAILABILITY

a. Supplies

A survey made by the Inter-American Tropical Tuna Commission revealed concentration of tuna in the Central American area extending from the Gulf of Tehuantepec to the Gulf of Panama, including the Galapagos Islands. This highly productive area of blue fin, yellow fin, albacore, and skipjack species lies well within 1,000 miles of any Central American West Coast port.

The present sustainable yield of yellow fin tuna in this eastern tropical Pacific area is estimated at about 81,000 tons per year. The 1964 limit of 77,000 tons was recommended to rebuild yellow fin stock to maximum production, estimated to be 91,000 tons per year. While official recommendations of the Inter-American Tropical Tuna Commission 1965 meetings are not

yet available, informal publicity indicates that attempts will be made to rebuild the stocks to allow the 91,000 tons per year catches. The yellow fin tuna has generally been available at \$205 per ton to the canneries, and skipjack tuna has generally been available at \$171 per ton. In addition, if the product is oil packed, sizable amounts of cottonseed oil will be required. This, of course, will present an opportunity to upgrade the use of another Central American product.

b. Labor Requirements

The recommended plant would employ about 200 persons, of whom 175 would be unskilled. This labor is available in most areas of Central America.

4. INVESTMENT

The optimum size plant should be designed to process 50 tons of whole tuna per day, or 12,000 tons annually, operating 8 hours per day at 240 days per year. A facility of this size will require a fixed capital investment of approximately \$1,250,000 as follows:

CAPITAL REQUIREMENTS

<u>FIXED CAPITAL</u>	<u>COST \$ U.S.</u>
Land 5 Acres	65,000
Building 72,982 Sq. Feet - 6,787 Sq. Meters	208,000
Machinery and Equipment	350,000
Steam Generators	16,000
Water System	7,000
Refrigeration, Cooling and Ice	175,000
Fish Meal Reduction	60,000
Other Tools and Equipment	10,000
Furniture and Fixtures	3,000
Autos and Trucks	8,000
Ocean Freight on Machinery and Equipment	85,000
Installation Costs	50,000
Start Up Costs	50,000
Contingency	<u>163,000</u>
 TOTAL FIXED CAPITAL	 \$1,250,000

It is estimated that working capital will be required to support the operation for a period of 60 days. This amount will range between \$1 million and \$1.5 million.

5. ELEMENTS FOR FUTURE CONSIDERATION

Fish liver oils are a principal source of natural vitamin A and contain substantial amounts of vitamin D as well. Both are used to fortify foods in addition to their applications in the pharmaceutical industry. The isolation and purification of these materials should be considered after the establishment of the freezing and canning facility.

We have assumed the tuna-processing plant will initially purchase fish from foreign owned tuna-clippers. Later integration to Central American vessels should be considered when the feasibility of operation is demonstrated.

## D. PINEAPPLE

We recommend a coordination of the many previous studies that have been made concerning the use of Central American pineapple. This review will include the selection of the appropriate variety of the fruit and establishment of cultivation and processing facilities.

### 1. DESCRIPTION

Substantial areas of Central America have fairly large quantities of pineapple available during certain times of the year. Various projects for the utilization of this fruit have been suggested during the past few years, and pilot operations are now underway in Costa Rica and in Honduras. Some of the high-grade fresh fruit is shipped to the United States but the quantity of this export is relatively small. Previous attempts to process pineapple have not been satisfactory as a result of inadequate technical direction. It has been reported that most varieties of Central American pineapple are not suitable for canning purposes; however, there are no reliable data to indicate that this is a fact. There are several pineapple products in addition to fresh pineapple that may have commercial possibilities; the largest commodity is, of course, canned pineapple in various forms, such as sliced, wedges, crushed, pieces and juice. Pineapple jams and jellies also offer access to a substantial market. The major processors of pineapple have valuable, well-known brand names: Dole, Del Monte, Libby.

A product of recent development and rapidly increasing volume consists of pineapple pieces in a sugar syrup handled under refrigeration. This product is incorporated into citrus salads that are distributed in the United States, a refrigerated but not frozen item. The principal processors of these salads in the United States are National Dairy Company and Tropicana.

The principal pineapple-producing countries in the world are: the United States (State of Hawaii), the Phillipines, Australia, South Africa, Federation of Malaysia (Malaya), Formosa, Mexico, Cuba and Puerto Rico. The State of Hawaii has produced in the past almost twice as much pineapple as all of the rest of the world combined. The total world production of canned pineapple is more than 20 million cases; each equivalent to 24 16-ounce cans of fruit.

### 2. MARKET AND DISTRIBUTION

The United States is by far the largest consumer of pineapple; the value of fresh pineapple imported into the United States averages about \$2 million per year and that of canned pineapple of all kinds is about \$150 million per year. Trends in the U. S. consumption are indicated below:

UNITED STATES PINEAPPLE CONSUMPTION  
(Thousand Cases)

<u>Year</u>	<u>Pineapple Juice</u>	<u>Pineapple</u>
1953	14,654	17,977
1954	14,292	19,948
1955	14,213	19,985
1956	14,855	18,557
1957	11,249	19,483
1958	13,465	19,489
1959	11,922	20,947
1960	12,951	20,978
1961	13,508	21,159
1962	13,582	21,159
1963	13,094	20,768

The approximate wholesale price of canned sliced pineapple per case of 24 16-oz. cans is about \$7; pineapple juice is 46 oz. cans wholesales for about \$2.80 per case of 12 cans.

### 3. COSTS AND AVAILABILITY

It has been estimated that fruit weighing about 4 lbs. can be produced for between 6¢ and 8¢ each delivered to the plant. The plant should be located near a major source of supply in order to take advantage of lower transport costs and less damage to the ripe fruit.

### 4. PRODUCTION AND INVESTMENT

Pineapple production in Hawaii is dwindling rapidly and at least one major manufacturer has already left the area because of high labor costs and high land values. Central American should be in an advantageous situation to assume part of the production which is leaving Hawaii. Central America has the advantage of being very close to the United States and Canadian markets, as well as having favorable soil and climatic conditions. While locally grown Central American pineapples are not the usual canning variety, they are unusually sweet and flavorful, and may be eminently suited for chunks in syrup or as pineapple juice.

On the assumption that the recommended program of reviewing previous studies has a favorable result, it may be possible to establish an initial processing plant to supply local demand and test the export market.

The facility we envision would produce 2,400 lbs. of canned pineapple products per day (100 cases). The capital investment for such a plant would be approximately \$100,000; working capital would be about \$100,000 to support the operation for 90 days. We have assumed the plant would operate 150 days per year.

#### 5. ELEMENTS FOR FUTURE CONSIDERATION

It would be lamentable if the future of pineapple cultivation and processing in Central America were to be limited to the small plant described above. As far as we now know, the earlier major studies of pineapple processing opportunities have been favorable. Pineapple is grown in many parts of the world; what differentiates the big from the small producers is organization of agriculture and understanding of marketing and distribution. The \$150 million import market of the United States awaits the initiative and imagination of Central American producers, possibly working together with major United States marketers. A 10% share of this market would be a reasonable goal.

## E. CANDY MANUFACTURE

We recommend a detailed feasibility study for evaluating the establishment of a facility to produce sugar-based hard and filled candies in Central America for export to the United States and other markets.

### 1. DESCRIPTION

The candy business falls into quite distinct types, each of which has its particular problems and conditions to be met for a successful operation. The hard and filled candies comprise a specialty manufacturing business which supplies other manufacturers and packagers and sells candy directly to large retailers. It is an industry of about \$125 million per year.

The establishment of a modern, export-oriented, candy-producing industry in Central America will increase the value of a portion of a major agricultural crop -sugar- will add foreign exchange earnings, and create employment. These products are now being manufactured in each of the five Central American countries. However, their quality is not adequate to develop an export market. Actually, Italian, Colombian and German candies are being imported into Central America.

The candy industry is a segment of the food industry; classified as to raw materials, it is a segment concerned with the manufacture of food specialties based upon sugar. The technology stems from an ancient art developed in the candy kitchen and has traditionally been under the control of candy experts.

Chemists and engineers employed by the industry have succeeded in reducing some of the art to modern processing and controls. The more successful candy manufacturers employ effective quality control procedures to provide prime quality in terms of flavor, texture, size, weight, density, etc. Most candy-manufacturing companies have developed a substantial degree of automation and mechanization during the past 20 years. Much equipment used by the food and bakery industry has been adapted to candy manufacture. Completely mechanized processes are available for production of most types of hard and filled candies.

### 2. MARKET AND DISTRIBUTION

The annual United States market for all candy products is approximately \$300 million and is increasing at a rate of 3% per year. About 10% of this market is made up of hard and filled candies of the type that is recommended for manufacture in Central America. Beginning with 1957, candy sales began to grow at a rate faster than population growth. Two

factors have been associated with the renewed growth rate: 1) lower raw material costs, and 2) a growing proportion of the population in the younger age groups -- those groups that have the highest per capita consumption.

<u>Age Group</u>	<u>% Increase 1960 - 1970</u>
Under 5 years	23
5 - 17 years	45
18 - 24 years	2
25 and over	12

The rapid increase in population in the younger age groups seems to hold promise for the future of the candy industry for the coming years.

#### 1962 U.S. CANDY SALES

<u>Bar Candy</u>	<u>Per Cent</u>	<u>Million \$ U.S.</u>
Multibars	6	16.8
Bagged	5	14.0
Single bars	5	14.0
Chocolate, multi	4	11.2
Chocolate, large	4	11.2
Chocolate, single	3	8.4
 <u>Others</u>		
Chocolates, plain and coated	18	50.4
Holiday specials	8	22.4
Mints	7	19.6
Peanut types	7	19.6
Marshmallows	5	14.0
*Hard Candy	5	14.0
Jellies	4	11.2
Caramel, Taffy	4	11.2
*Lollipops	3	8.4
*Roll Mints	2	5.6
Licorice	1	2.8
Boxed Chocolate	1	2.8
*Other candies	8	22.4
Total	100	280.0

\* Items of interest to Central American processors.

The world market for hard and filled candies exceeds \$30 million/year. A great part of this market is in the United States where the per capita consumption is approximately 1.7 lbs. The 1962 imports alone totaled 72,000,000 lbs., much of which came from many European and Latin American countries. The market for these candies is extremely sensitive to cost rather than to brand identification. If candies can be produced in Central America for less than 20 ¢ per lb., Central America can acquire a substantial portion of the U.S. market -- considerably in excess of 10,000,000 lbs. per year. The ability of Central America to develop this market will depend not only on low sugar cost, but efficiency in manufacture and marketing.

Demand is also strong for these candies in West Germany and Canada. Colombian candies are now being imported into both of these countries. Markets in European countries other than West Germany and France are limited at present by overproduction of candies in The Netherlands and England. Central America offers a market potential in spite of high export duties which amount to as much as 200% ad valorem.

MARKET POTENTIAL  
FOR CENTRAL AMERICAN-PRODUCED  
HARD AND FILLED CANDIES

<u>Country</u>	<u>\$ U.S. Per Year</u>
Canada	250,000
Costa Rica	More than 10,000
El Salvador	" " 10,000
France	" " 5,000
Guatemala	" " 15,000
Honduras	" " 10,000
Japan	500,000
United States	2,000,000
West Germany	<u>500,000</u>
Total	3,300,000

Any supplier of candy to the United States must comply with the requirements of the Food and Drug Administration. Some problems may exist in regard to the use of artificial colors and flavors, but these can be resolved. The majority of common artificial flavors are cleared for use. All natural flavors are permitted.

Correct packaging is a vital factor in successful candy operations. Where in the past package design was primarily oriented toward product protection, marketers now look to the package to perform vital merchandising functions in addition to the protection requirement.

A projected growth of the hard-candy market can be expected to show a very small or no increase. In the United States the annual candy market growth rate is estimated to be 3%. The calorie-conscious world is consuming less and less candy per capita. The increased market for Central American hard candies therefore will be dependent upon the ability to compete on an economic basis.

Competition for the hard and filled candy market can be expected from both U.S. and European sources. For example, Motta, an Italian manufacturer of confections, has a well-established distribution system throughout the world for all of its products, including hard candy. In the United States, E.J. Brach Company produces a large amount of the hard candies sold in the United States. There are numerous other processors throughout the world that distribute their candy through major outlets in the United States as well as in other consuming countries. It is most likely that each company in the hard-candy processing business has capacity to expand a considerable amount. However, those countries that produce sugar at reasonable costs can exploit this advantage in the market. While conventional candy-production processes are well established, some attention should be given to the possibility of producing quality candy from some intermediate sugar product -- that is, sugar in some form short of refined granulated such as clarified raw syrups. Such production devices should give Central American candy manufacturers a further advantage in this price-conscious market.

SOME CANDIES IMPORTED INTO U. S.

<u>Country and Manufacturer</u>	<u>Item</u>
<b>BELGIUM</b>	
Godiva	Chocolates
S. S. Pierce	Belgian Lemon Sour
<b>COLOMBIA</b>	
*Fábrica de Dulces Clombian Ltd.	Colombian Coffee Break
<b>ENGLAND</b>	
Batger & Co. Ltd.	English Sugar Babies
Collard & Bowser's	Cream-Fine Toffee
Horner's	Assorted Toffees
Keiller	Butterscotch
Mackintosh's	Chocolate and Toffees
Mortin's	English Assorted Drops
<b>FRANCE</b>	
Becco-Matter	Hard Candy with Natural Fruit Flavors
Coq Blanc	Assorted Fruit Flavors
Lanvin, S. A.	Chocolate Snails
Jean Toublat	Anise

SOME CANDIES IMPORTED INTO U.S. (Concluded)

<u>Country and Manufacture</u>	<u>Item</u>
HOLLAND	
Droste	Assorted Chocolates
Dutch Cottage Candies	Chocolate-Covered Candies
Van Dungen's	Rum-Flavored Cordials
IRELAND	
Urney-Irish Heritage	Chocolate-Covered Candies
ISRAEL	
Doran	Chocolate-Covered Jellies
Lieber's	Assorted Chocolates
ITALY	
Bocci	Chocolate Kisses
Motta	Nougat Candy - Torrone
	Extra Fancy Chocolates
SPAIN	
Torta's	Spanish Nougat
SWITZERLAND	
Lindt	Apricot and Raspberry-Filled Chocolate
	Coffee with Chocolate
	Swiss Chocolate
Tobler	Assortment of Tiny Wrapped
	Chocolate Bars
	Swiss Bittersweet Chocolate
	Chocolate Peppermint Creams
WEST GERMANY	
HaChez	Bittersweet Chocolate Leaves
Sprengel	Nougat Eggs (mostly chocolate)
Stroch	Fruit Liquid-Center Candy
OTHER	
Maillard	Eagle Sweet Chocolate Bar
S.S. Pierce	Fruit Mix
	Chocolate-Covered Candies
Plantation Choc. Co.	Fruit Flavors

\* An outstanding example of high-quality hard candy aggressively marketed.

SOME DOMESTIC HARD CANDIES

<u>Manufacturer</u>	<u>Item</u>
A. & F. Candy Mfg. Co., Inc.	Sour Drops
Brigham's	Fruit Cuts
Charms	Assorted Sour Balls
Fairyland Sweets, Inc.	Rainbow Kisses
Guarino Sales Co.	Jo-An Candies
Jordan Marsh	Old Fashion Fruit Mix
Reeds	Butterscotch
Welch	Jamaica Mints
Worthmore (A&P)	Jelly Rolls

The major market for Central American production will be, we believe, in the United States, although European and Japanese markets will contribute. The major outlets for these products will be such supermarket chains as A&P, Kroger, Safeway, Jewel Tea, F.W. Woolworth, and others. Their requirements as to flavor, size, color, shape, packaging, and, of key importance, price must be fulfilled.

Brokers are used by the majority of candy manufacturers, exclusively by about half of them. A few of the largest companies sell most of their product through their own salesmen, but the majority of firms sell the biggest portion of their volume through candy or food brokers. Traditionally, the candy broker has been the most important in the distribution of candy. In recent years, however, many food brokers have taken on candy lines. The traditional candy jobber very often buys selected items from individual manufacturers in bulk and packages them in cellophane bags under his own label. There are approximately 300 such operations in the United States. Average sales volume per firm is about \$500,000 but some of the large operators in major metropolitan areas sell as much as \$10,000,000 per year. By using a packaging jobber as a means of distribution, the Central American candy manufacturer can reach a large portion of the market with minimum sales costs.

### 3. COSTS AND AVAILABILITY

We believe it will be possible to produce hard candy for export at a cost in the neighborhood of 15¢ per pound. Raw materials for the manufacture of candy comprise essentially of sugar, flavor materials, and color materials. One of the attractive features of the project is, of course, to upgrade in value the sugar now available in Central America. Flavor and coloring materials are currently available from a company in Costa Rica and importation of these can therefore be avoided. Packaging materials will comprise at least 20% of the raw material costs. As the need develops, the production of packaging materials in Central America will increase.

#### 4. INVESTMENT

The facility as we envision it will require a fixed capital investment of \$500,000 and will have an approximate capacity of 10,000,000 lbs. of production per year. This, however, is not a minimum plant size. A detailed feasibility study may indicate the desirability of several smaller plants requiring investment of \$100,000 each and producing 1,000,000 lbs. of candy per year.

Sales of candy are of a seasonal nature. Manufacturers' sales reach a peak in September and October. The major reasons for this are the advent of cooler weather and the stocking up for the large "candy" holidays Halloween, Christmas, and New Year's.. Under these conditions it will be necessary to supply \$600,000 as working capital to support the operation for six months.

## F. BANANA UTILIZATION

We recommend that a definitive, comprehensive study be undertaken to determine the economic and technical feasibility of the establishment of an integrated banana-product manufacturing facility in one of the Central American countries. The plant we envision would produce banana purée as well as other banana products for which suitable markets can be defined. It would be oriented toward export markets in the United States, Europe, and Japan.

### 1. DESCRIPTION

The establishment of a profitable industrial complex based upon banana utilization would create a desirable export industry, an outlet for one of Central America's most richly abundant raw materials. It has been estimated that more than 50% of the stems of bananas harvested each year are either sold for domestic consumption or simply abandoned. While it is not possible that banana processing could ever completely utilize the available surplus from all the countries, it could consume considerable amounts. Some sources have estimated that eventually the value of present unutilized or waste products could approach the value of the exported bananas themselves.

Depending upon the aggressiveness and success of marketing efforts, a banana-processing facility such as we envision could initially return to Central America up to \$2 million per year in foreign exchange. This estimate is based upon Central America's securing approximately 40% of the U. S. market for banana purée. Last year the United States consumed 40,000,000 lbs. of purée at prices ranging from 12¢ per lb. to 18¢ per lb., and this represented a \$6 million market. Even higher foreign exchange earnings could be obtained by 1970.

In dollar terms the banana is the most popular fruit in the United States and ranks among the best sellers in most European countries. United States per capita consumption is approximately 25 lbs. compared to 40 lbs. of all citrus fruits and lesser amounts of apples, pears, peaches and others. However, practically no processed banana is presently marketed. This is in sharp contrast to most other fruits for which the amount consumed in processed form is approximately equal to that consumed in fresh form. Prior studies provide some ground for inferring that a substantial market can be developed for processed or preserved banana products.

One accepted product, banana purée, accounts for 30-40,000,000 lbs. per year in the U. S. market alone. Approximately 75% of this amount is used in making baby food. The remainder is used in ice-cream and bakery goods production.

The European market for banana purée is estimated at 10,000,000 lbs. and there is a developing Japanese market. Other banana products are technically producible and are beginning to achieve acceptance in some markets. These include:

- a) Banana figs -- a dry, ripe banana with about 20% residual moisture. This product has a fig-like appearance and

attractive flavor. It is used as a confection and is also incorporated into baked goods -- particularly cookies. This product has been popular in Europe for many years. It has recently found disfavor because manufacturing procedures have been most unsanitary with resulting insect infestation of the product.

- b) Dehydrated banana -- pieces, flakes, or powder. Within the last 12 months there has been a dramatic increase in the use of these products in packaged pudding mixes and breakfast cereals.

General Foods Corp. is marketing a banana-flavored, starch-based pudding mix that contains dehydrated banana flakes. The resulting reconstituted dessert is a pudding with pieces of actual banana.

The Kellogg Company has recently placed in a test market a major breakfast cereal -- corn flakes with dehydrated banana pieces. This product has caught the imagination of the consumer and it may be expected that a large volume of product will be sold. The total breakfast cereal market in the United States is approximately \$750 million. If 5% of the product in this market has potential of containing dehydrated banana, then the potential use of dehydrated banana in this field will exceed \$1 million per year.

- c) Thermally processed banana slices or spears. This product is analogous to other "canned" fruits. It is only recently that the techniques for producing this product have been developed. Preliminary market investigations have indicated a very large market in the bakery industry as well as at retail.
- d) Banana flour made from green bananas. This product can be used to augment wheat flour in bread baking, thereby reducing the requirements for imported wheat.
- e) Banana chip -- a deep-fried snack item made from bananas or plantains. The potato chip market in the United States is approximately \$1 billion. Those items that are similar to potato chips yet have some unique property can take a good portion of this business. The banana chip is such an item.
- f) Banana starch can be made successfully from green banana. The present use of boxes to ship bananas requires a substantial amount of starch to produce these boxes. This starch is now imported. The starch requirement for Central American banana-box manufacturing facilities now exceeds 500 tons per month.

Although alternative plans may be considered, we believe that advantages will accrue from the processing of many banana products at one manufacturing location so located to take advantage of banana production from two or more Central American countries. An integrated plant is attractive for a number of reasons:

- 1) Knowledge regarding the chemical and physical properties of bananas as they relate to processing is highly specialized. The number of individuals possessing this knowledge is limited. Therefore, this knowledge which is applicable to all products would not be available at several installations, or at best, would be costly.
- 2) Much equipment is common to the production of many banana products; for example, costly ripening rooms can serve for all products derived from ripe bananas. Equipment economies can likewise be achieved for operations such as washing, peeling, inspecting and packaging.
- 3) Manufacture of products derived from green fruit would very likely benefit economically from the availability of green rejects from banana-ripening processes.
- 4) Marketing processed banana would have to be accomplished by well-trained individuals acquainted with banana products.
- 5) Additional economies could result from using a sales force capable of representing a variety of banana products.

## 2. MARKET AND DISTRIBUTION

The present market for one accepted product, banana purée, accounts for 30-40 million lbs. per year in the U.S. market alone. Approximately 75% of this amount is used in making baby food. The remainder is used in ice-cream and bakery goods production. European market for banana purée is estimated currently at 10 million lbs., and there is a developing Japanese market. Banana purée is sold in large quantities, i.e., carload quantities, at about 12¢ per lb., and in smaller quantities as high as 20¢ per lb. The present market for other banana items is limited. There is a market in Europe for the banana figs amounting to less than \$500,000 per year.

While the expansion of the U.S. market for banana purée to be used in baby food will follow the population growth of about 3½% per year, it can be expected that banana purée used in the bakery and confectionery field will increase at a rate of about 10% per year. Complementary to this, the European and Japanese market for banana purée to be used in baby food should expand rapidly since baby foods are just being introduced into these areas. This is also true for Latin American countries where canned processed baby food is just beginning to become popular. The potential market for other banana products will be dependent mostly upon the sales effort exerted. In regard to banana starch, the future market for this product lies in its use as an adhesive in making banana boxes in Central America.

Banana purée is now processed in the United States by Pan-Am Foods, Inc., in Brownsville, Texas, and United Foods in Louisiana. Both firms produce a frozen purée. Their raw material is table-quality fruit which is not sold by importers for table use. With the increased use of boxed fruit and the increased cost of bananas, these processors will be paying more and more for their raw materials. U.S. baby food manufacturers are

willing to pay a premium to these U. S. producers in order to maintain several sources of supply. However, manufacture of purée in the United States is becoming more, rather than less, expensive. In addition, a major processor of aseptically packaged banana purée is United Fruit Company with its plant at Manzanillo in the Dominican Republic. There is serious question as to the future of the Dominican Republic as a banana-producing country because of Panama disease. In the event that banana production becomes limited in the Dominican Republic, the economics of producing banana purée in that country will not be attractive.

Banana purée is now distributed to the baby-food manufacturers directly from the purée producers. The banana purée distributed to the bakery, ice cream, and confectionery industries is generally distributed through brokerage houses that handle other items used by these clients. If a company uses large quantities of banana purée, however, the distribution is frequently directly from the purée manufacturer to the user.

### 3. COSTS AND AVAILABILITY

#### a. Raw Materials

Raw materials are, of course, abundantly available. Banana purée requirements are such that production of 20 million lbs. of purée per year will require 40 million lbs. of bananas. This amount is certainly available from Central America. Raw material costs will, of course, affect selling prices. At 12¢ per lb. selling price, bananas for processing must be available at less than 2¢ per lb.

#### b. Labor

The labor required for processing bananas is primarily that for hand-peeling since there has not been developed any successful machine for peeling bananas. This labor is female, unskilled, and is available without limit in most Central American areas. Since the bananas must be hand-peeled in other parts of the world where banana purée is manufactured and since labor costs in Central America are lower than in either the United States or the Dominican Republic, peeling costs there will be lower to allow for competitive pricing of the finished material.

### 4. INVESTMENT

We estimate a fixed capital investment requirement to be approximately \$2.2 million. Such a plant will be capable of processing approximately 75 million lbs. of fruit per year. This will yield, for example, roughly 30 million lbs. of purée or other processed banana products. Smaller plants capable of processing roughly 5 million lbs. of fruit per year are also possible. However, we believe the larger plant to be of economical size and suitable for competitive purposes. In such a plant, further development could take place in sequential phases according to increased market requirements for each product.

ESTIMATED CAPITAL COST  
OF CENTRAL AMERICAN BANANA PRODUCTS  
MANUFACTURING FACILITY  
(\$ U.S.)

BUILDINGS (Including Site Improvement and Utilities)

Ripening Area	28,000 sq. ft	
Processing Area	11,000 sq. ft.	
Storage & Misc. Area	<u>29,000</u> sq. ft.	
Total at \$15/sq. ft.	68,000 sq. ft.	\$1,020,000

EQUIPMENT (Including Freight and Erection)

Process Equipment	\$450,000	
Process Piping	15,000	
Laboratory Equipment	10,000	
Boilers & Access.	40,000	
Ventilation Equipment	15,000	
Storage Refrigeration	25,000	
Refining Rooms	300,000	
Material Handling Equipment	100,000	
Waste Disposal	45,000	
Engineering & Contingencies	<u>200,000</u>	<u>1,200,000</u>

T O T A L \$2,220,000

The estimated capital expenditure for an expandable facility initially to produce 15 million pounds of product per year would be \$1,850,000.

It is estimated that operating capital will be required for 90 days of operation. At maximum capacity, this would be 7,500,000 lbs. of purée at approximate cost of 8.5¢ per lb. or \$637,500. Undoubtedly initial operation would be less than 100% capacity and hence initial operating capital would be lower. A reasonable expectation would be 50% of capacity or the operating capital equivalent of just over \$300,000.